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All these four mice remained in good health. Control-mice, on the contrary, which were at the same time inoculated with .0001 of a cubic centimetre of the original culture, succumbed within thirty-six hours.

All the mice mentioned in each of the above series of experiments have been subjected to repeated injections with the tetanus bacilli, and have shown themselves to be permanently and completely immune.

This result is the more remarkable in that up till now, in spite of innumerable attempts, no one has ever succeeded in making any animal whatever immune against tetanus. A theory of the nature of acquired immunity which at once led to a method of treating the disease which is easy to understand, harmless to the animal, and certain in its effect, must surely possess some basis in fact.

Naturally every kind of control experiment with serum of normal rabbits has been carried out with uniformly negative results. Serum of cattle, horses, and sheep has also been found to have no action on the tetanus poison. The living blood and tissues of an animal which has not been made immune, likewise show no power of destroying the tetanus poison, as appears from the following experiment, which has been many times repeated:—

Rabbits into which .5 of a cubic centimetre of a germ-free tetanus culture is injected subcutaneously, succumb after showing typical tetanus symptoms. Almost always a serous transudation is to be found in the thoracic cavity. Of this transudation .3 of a cubic centimetre is, on the average, enough to kill a mouse with typical tetanus symptoms. The same is true for the blood.

The authors close their paper by pointing out the possibility that their method of curing tetanus and diphtheria which they have used with such brilliant results on animals so highly susceptible to these diseases as mice and rabbits, may also be used for the far less susceptible hospital patient. They also note the possible influence of their work on the practice of blood-transfusion.

E. H. HANKIN.

HEALTH MATTERS.

Risks to Health in East Africa.

THE colonizing wave setting steadily from Europe to East Africa gives peculiar interest to Dr. Kohlstock's experience of the risks to health and the chances of longevity among his compatriots in that region. As director of the sanitary arrangements at the German headquarters, says the *Lancet*, he has had excellent opportunity of forming his opinions, and the sense of responsibility with which he gives them to the world is in some measure a guaranty of the care with which he has collected his facts and drawn his conclusions. The first note he strikes is one of warning. Let no one, in any stage of phthisis, even the pre-tubercular, think of settling in East Africa, if he does not want to leave his bones in its soil. At first this danger was not appreciated in the Fatherland, and the inspection of officers setting out with colonizing parties was carried out in somewhat perfunctory fashion. But the climatic conditions of the region soon made their effects apparent, and nine subalterns had to be sent home, —precisely those in whose families pulmonary phthisis had prevailed. For a man of thoroughly sound constitution the two diseases to be dreaded are dysentery and malaria. The former, in Dr. Kohlstock's experience, responds satisfactorily to the measures usually taken in European centres in the East, the disease among the German troops running generally as favorable a course as in French or English garrisons. The latter is dangerous only when the patient is precluded from taking rest, and compelled to continue at work; as, for instance, on necessarily forced marches. Even so, but three fatal cases have as yet been recorded among the German troops in East Africa as due to

malaria. As a rule, under conditions of rest the malaria patient soon gets well. In stubborn cases he has to be transferred to the sanatorium; the transference hitherto being effected on ship-board, in the absence of railways. Very often the change of locality, coming after the voyage, has sufficed to restore the patient's health. A liberal allowance of fresh butcher's meat has proved the most efficacious diet in malaria: indeed, the risks arising from the disease have been greatly reduced by the excellent nursing and accommodation now enjoyed by the patient. Dr. Kohlstock holds it to be a mistaken practice to completely cut off alcohol as a prophylactic against malaria: he would rather, within the limits of temperance, that the German in East Africa should live, as far as possible, as he did at home. The necessary upturning of the soil for purposes of tillage is, in such virgin territories as that of German Africa, the most prolific source of malaria; and, at that inevitable stage of colonizing operations, the sanatoria must be in constant requisition, and their treatment supplemented by change of locality for the convalescent. So well, however, have these measures been understood and carried out, that Dr. Kohlstock can point to a steady diminution in the statistical returns of malaria cases; the places where the disease has been most pronounced being, naturally enough, those like Mpwapwa, where the earth exhalations from the disturbance of long inert soil have been the most extensive, while no good water-supply has been obtained by boring. Soon, however, a marked reduction of the malaria returns will, it is hoped, be effected even in that locality.

LETTERS TO THE EDITOR.

**** Correspondents are requested to be as brief as possible. The writer's name is in all cases required as proof of good faith.*

The editor will be glad to publish any queries consonant with the character of the journal.

On request, twenty copies of the number containing his communication will be furnished free to any correspondent.

A New Kansas Meteorite.

THE year 1890 has brought to scientific knowledge a larger number of tangible celestial visitants than all preceding years combined. Up to this year the Waconda meteorite was the only representative from Kansas on the list of authentic meteoric falls. In March of this year the now famous group of irons from Kiowa County was made known to science; and on June 25, 1890, the Washington County aerolite was heard and seen to fall at mid-day by thousands of Kansas citizens; and now, just at the close of the year, I have the pleasure of announcing a third fall of unknown date. This may be called the Tonganoxie meteorite. So far as now known, this fall consists of a single specimen, weighing 26½ pounds. It is an iron of the ordinary character (not a pallasite). It is of an irregular shape, and is thought by the owner to resemble a lion couchant. It is 9¾ inches long, 6½ inches wide, and 3½ inches deep.

This meteorite is the property of Mr. H. C. Fellow, principal, 1887-90, of the Friends' Academy at Tonganoxie, in Leavenworth County, now pursuing a post-graduate course of study in the University of Kansas. Mr. Fellow bought it in the spring of 1889 of Mr. Quincy Baldwin, who found it upon his farm, one mile west of Tonganoxie town, in 1886. Mr. Baldwin was not aware of its true character, although he had manufactured a fish-hook from a small fragment of the iron. He considered it to be a piece of iron ore, and proposed to start an iron-mine upon his farm; but this fragment proved to be the only "indication," and the mining project was reluctantly abandoned. This meteorite is now deposited in the museum of the University of Kansas, but is still the property of Mr. Fellow. A preliminary analysis shows the presence of iron, nickel, and cobalt. Professor E. H. S. Bailey will soon publish a complete analysis.

A small portion of the surface has been polished, and exhibits very distinctly the Wiedmanstaaten figures. Careful search has recently been made for other fragments of this meteorite on the Baldwin farm and vicinity, but without success.

F. H. SNOW.

Lawrence, Kan., Dec. 27.